

# PROBLEMS OF ECONOMY

UDC 666.3.013.003

## RESTRUCTURING PORCELAIN AND FAIENCE INDUSTRY IN THE PRIMORSKII REGION

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It is demonstrated that, after restructuring, the use of rich local raw materials and available resources for raising production efficiency will bring the porcelain-and-faience sector of the industry out of the current crisis. It is proposed to set up a horizontal territorial association integrating mining and processing companies; its main elements are specified.

There are two porcelain factories in the Primorskii Region, namely, the Artemovsk and the Vladivostok factories with a design output of 3 and 24 million pieces per year, respectively.

Initially these two factories were not competitors but complemented each other, satisfying the consumer demand both in expensive porcelain and in cheaper everyday dishware. In the early 1990s the Vladivostok Porcelain Factory annually increased its output, reaching its maximum production level in 1992. The following year its production slightly declined and later dramatically collapsed. A similar situation occurred at the Artemovsk Porcelain Factory.

It is possible to identify the principal factors that have a positive or negative effect on the production of household porcelain in the Primorskii Region (Table 1).

Despite the predominance of negative factors, there are reserves for increasing the production efficiency of the porcelain factories in the region, and the future progress of the industry to a large extent will depend on the rational use of these resources.

### Reserves for raising production efficiency of porcelain factories in the Primorskii Region

#### *Reserves in using the potential of the factories*

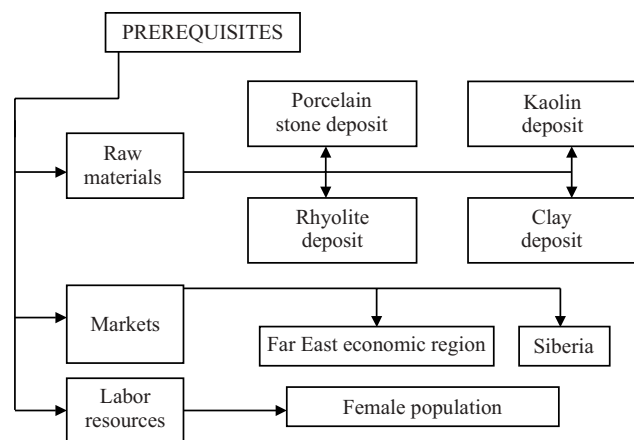
Reserves of production and technological potential	Increase in machinery utilization level Efficient use of production space Upgrade of production technology Use of new kinds of materials
Labor reserves	Raise labor efficiency Encourage creativity of personnel

Financial-economic reserves of companies	Increase the investment attractiveness of the company Increase the financial stability of the company
Reserves of organization potential of the company	Improving the use of scientific potential of the company Improvement of advertising efficiency Improvement of product quality Renewal of product range Expansion of application areas for products, especially new ones
<i>Reserves in using external factors</i>	
Financial-economic reserves	Increase the efficiency of using borrowed capital Use of state grants, subsidies, credits, and investments
Reserves in using market situation	Selection of target market and its segments Search for new market niches

TABLE 1

Factor	Effect	
	positive	negative
Absence of traditional material deposits	–	+
Presence of nontraditional material deposits	+	–
Labor resources	+	–
Competition from domestic and foreign porcelain manufacturers	+	+
Existence of market	+	–
Low utilization of production capacities	–	+
Low labor efficiency	–	+
Obsolete and worn machinery	–	+

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**Fig. 1.** Prerequisites for porcelain production in the Primorskii Region.

Numerous problems confronted by the porcelain factories of the Primorskii Region have caused the company management to choose a waiting strategy typical of most Russian companies; therefore, the reserves for increasing the company efficiency were not taken into account. However, in market conditions a company ought to have a prospective development program, making the best possible use of its internal resources.

There are certain prerequisites for the successful development of the porcelain and faience industry in the Primorskii Region (Fig. 1). One of the most important prerequisites is the existence of natural resources, some of them unique.

In 1963 metamorphic rocks were discovered that are suitable for the production of porcelain mixtures. The reserves of porcelain stone in categories B + C<sub>1</sub> amount to 3138 thousand tons, including 867 thousand tons in category B and 1746 thousand tons in the off-balance category. Porcelain stone from the Gusevskoe deposit is a unique complex material that has no analogs in Russia and former Soviet republics.

Four grades of porcelain stone are currently recognized in accordance with standard TU RSFSR 29104–88 “Secondary quartzites from Gusevskoe deposit.” According to the definition of the Vladivostok Porcelain Factory, the quality of porcelain stone of grades B and M (alkali-free and normal-alkalinity varieties) in their chemical composition are taken to be equal to the super grade and grade one of kaolin-quartz material for fine ceramics and meet the requirements imposed on materials for porcelain production. Two other grades (alkaline varieties), as well as rocks that do not meet technical requirements, are classified as substandard material and are dumped to a special dumping ground until the possibility of its recycling is identified. As on January 1, 2000, the dumping ground contained 112,800 tons of porcelain stone. The balance reserves are equal to 2851.4 thousand tons. The industrial reserves are sufficient for 129 years of production.

The ceramic properties of Gusevskoe porcelain stone are in complete accordance with its mineral and chemical composition and make it suitable for the production of porcelain, faience, sanitaryware, building materials, electroceramics, and other kinds of ceramics.

Several deposits of argillaceous and kaolin materials have been prospected on the territory of the Primorskii Region. The majority of prospecting was carried out in 1960s; however, up to now most of deposits identified are not worked, although they have been recognized as promising.

The prospected resources of high-melting clays in the Far East economic region are localized in eight deposits. Over 75% of these resources are located in the Primorskii Region. Of special interest for the production of porcelain and faience are refractory and high-melting clays from the Chkalovskoe deposit, 2–3 km west of Sviyagino railway station. These clays are also suitable as batch additives for the production of high-quality porcelain and faience sanitary ware.

The Pavlovskoe occurrence of kaolin-bearing rocks is within the limits of the Pavlovskoe brown coal deposit (Mikhailovskii district). The prospective resources are estimated as 3 millions tons. The prospects of using this material are important for the development of material basis for the ceramic and glass industries, since kaolin after its concentration yields quartz sand, which is a scarce material.

Rhyolite from the Sergeevskoe deposit (Partizanskii district) is introduced into porcelain mixtures instead of feldspar in an amount not more than 6%.

At present only porcelain stone and rhyolites are used in the production of household porcelain.

The market economy and the new economic conditions have led to a number of problems facing industrial enterprises, which heretofore were unknown in the planned economy. The analysis of the state of production at the porcelain-and-faience factories in the Primorskii region performed by us has indicated that the companies were unprepared for solving these new problems and failed to cope with them. Obviously, without a radical restructuring of production, whose main purpose should be increasing efficiency, the companies will not be able to overcome this critical state.

The analysis of the porcelain factories in the Primorskii Region demonstrated that their isolated activities based on an enclosed production cycle (from preparing porcelain mixture to distributing finished product) does not provide for economic and financial stability and competitiveness of the product.

A principal step that can be proposed for the preservation and further progress of the porcelain and faience industry in the Primorskii Region is the creation of a horizontal territorial association (Fig. 2). At the first stage this association could include independent companies, i.e., the Vladivostok and Artemovsk porcelain factories, the Spasskii Art Ceramics factory, as well as small private companies making various ceramic products, including porcelain, and the Gusevskoe quarry. At the second stage manufacturers of ce-

ramic building materials and companies extracting raw materials for ceramics could join the association.

In setting up this association, factories can become specialized and do without a full production cycle, depending on their particular technological equipment.

The creation and effective functioning of such association requires certain conditions, otherwise the merging of factories will be impossible or ineffective. The analysis of these conditions suggests that the Primorskii Region has all the necessary prerequisites: territorial proximity, interrelation and homogeneity of production processes, and sufficient similarity of production profiles enabling it to promptly channel resources to the most profitable product, depending on demand on the domestic and, in future, international market.

Uniting the above listed factories will contribute to the creation of a single technological chain, lowering selling and marketing costs, optimizing employment policy, increasing the utilization of available production facilities, and diversifying the production; it will improve the attractiveness of this business for private investors and will create conditions for cooperation with scientific research centers.

The foreign practice in the ceramic sector shows that corporate associations in the ceramic industry have been successful in different countries. For instance, this approach was accepted in Germany as a result of a crisis that occurred in this sector in 1980s.

The association structure proposed by us includes the following basic elements:

- Association Management consisting of CEOs from all the factories that integrate the association, which determines strategic goals and purposes, coordinates the relationships between the association members with respect to the rational use of material, financial, and labor resources for the purpose of improving production efficiency;

- mining and processing companies that have the status of individual legal entities with individual accounting and have wide rights in managing their assets and profit;

- the commercial-exhibition, batch-preparing, technology design, and marketing centers directly subordinate to the Association Management.

The following directions are proposed as the main ones in upgrading the logistic and economic conditions of the porcelain and faience industry:

- formation of own material basis;
- implementation of the new technology;
- introduction of new kinds of products and revision of the existing product range.

*Formation of own material basis.* The available material resources and production capacities of the batch-preparing division of the Vladivostok Porcelain Factory makes it suitable to be reorganized into an integrated batch-preparing center to produce porcelain mixtures for both Primorskii factories and for small businesses. In the future this center can set up production of various types of ceramic mixtures for the members of the Association and for other consumers in

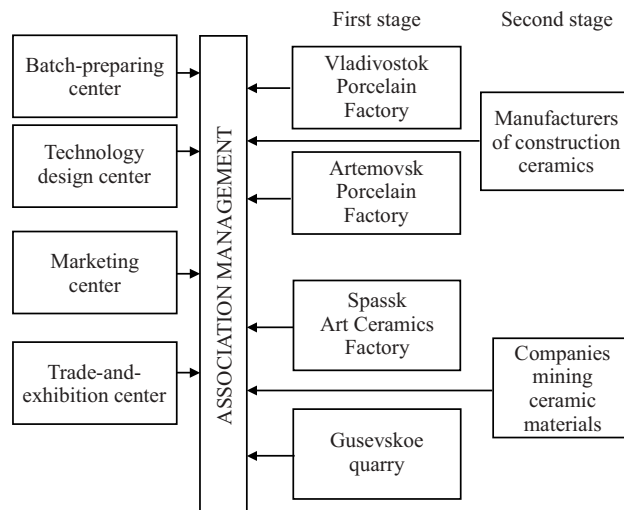


Fig. 2. The structure of association of mining and processing companies.

the Primorskii Region and outside this region. The practice of batch-preparing companies abroad, in particular, in England, indicates that such factories need to be located in an immediate vicinity of raw material deposits. At least 50% of materials should be local and the rest is delivered by railway. The main consumers of such mixtures will be primarily porcelain factories with obsolete batch-making machinery or factories that experience shortage of high-quality material. The efficiency of batch-preparing factories is corroborated by the fact that their production cost of porcelain mixtures is half as much as the cost of porcelain mixtures produced at porcelain factories.

The creation of a batch-preparing center in the Primorskii Region will make it possible to use local mineral resources more effectively. With existing technologies, the application of Gusevskoe porcelain stone at Russian porcelain factories is impossible (except for the Primorskii region) for the following reasons: the absence of equipment permitting the processing of this material; the absence of experience in producing porcelain based on Gusevskoe porcelain stone; the need to develop new formulas for ceramic mixtures containing the nontraditional material.

These problems can be solved only by organizing a single batch-preparing center on the territory of the Primorskii Region. The organization of such center would make it possible to prepare mixtures in accordance with specific production conditions of each factory based on particular orders. In the case of the formation of material basis for the porcelain and faience sector in the Primorskii region, the Gusevskoe porcelain stone deposit, which now supplies only the Vladivostok and Artemovsk factories, will be used more effectively. Another reason for the low utilization of this material is the fact that such grades of Gusevskoe porcelain stone as are unfit for porcelain but suitable for making sanitaryware, low-temperature porcelain, and fine-rock products are

currently not used in the Russian porcelain and faience sector. A centralized supply of mixtures will provide a solution to this problem.

*Implementation of a new technology.* We have developed a new technology for single-component porcelain based on Gusevskoe stone with an additive represented by the highly mineralized fishery waste that improves the consumer properties of the product. The use of this additive has raised the strength of dry porcelain preform to a required level and has made it possible to produce porcelain with high heat resistance and whiteness, to decrease firing temperature and, accordingly, reduce energy consumption, and to lower the production cost of products. The analysis of the properties of the resulting material indicates that it has no analogues in the world; even in China, where there is a deposit of a complex mineral material (known as china-stone), only two-component porcelain is produced, whereas all other manufacturers include up to 4–6 components in batches for making top-grade porcelain.

The change in the milling duration and firing conditions makes it possible to use this material for multipurpose fine-rock articles.

*Introduction of new kinds of products and revision of the existing product range.* For a number of reasons, products manufactured by porcelain factories in the Primorskii Region are inferior to other domestic and imported products in their consumer properties.

Consequently, our aim was to search for a new market niche for the Vladivostok Porcelain factory. The solution proposed by us will enable the company to perceptibly expand its sales volume while reducing the production cost. Our market analysis suggests that only by reorienting the Vladivostok Porcelain Factory to other nontraditional products will the company to occupy a significant place on the Russian market. One of the variants of solving this problem implies that instead of continuing the production of tea and

coffee sets and tableware, the company should organize the production of heat-resistance ware not only for eating, but for cooling or heating food, including microwave ovens. This choice has the following reasoning:

- Russian porcelain factories do not manufacture this type of products;
- this group of products does not involve substantial expenses;
- available machinery makes it possible to produce heat-resistant porcelain without substantial capital investments (such ware is currently imported from France and the Czech Republic and the demand is limited by high prices).
- the cost of such tableware will be significantly lower than that of imported analogs; consequently, it will have a higher demand, which will ensure steady sales;
- the demand for inexpensive microwave oven containers remains unsatisfied;
- heat resistance and radiation transparency of porcelain meets the requirements imposed on microwave containers.

Apart from the specified direction, in view of the unique material deposits found in the region, it is possible after corresponding research to organize the manufacture of new types of products (electric porcelain, sanitary ware, construction products). A prerequisite for this is the growth in housing construction, including individual houses. Housing construction is closely connected to the entire consumer system, since it increases the demand for sanitaryware, electric devices, garden decorations, and different kinds of tableware.

The implementation of these ideas is possible only by setting up a horizontal association of factories, since it would combine mining and processing companies located on the same territory and having similar production technologies, and their activity should be directed to achieving the common goal, i.e., the revival of the porcelain and faience sector of industry.